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Dealing with Atrazine

Aquilla Lake near Hillsboro once registered excessive levels of the herbicide atrazine, but a cleanup effort involving a host of participants now serves as a model for success.

Water quality in the Aquilla Reservoir is restored with assistance from many helping hands

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For the last six years, Aquilla Lake near Hillsboro has been the focus of concerns over drinking water. High levels of atrazine detected in 1997 and 1998 triggered projects to address agricultural sources of the herbicide by the TCEQ, the Texas State Soil and Water Conservation Board (TSSWCB), and other agencies.

The campaign to restore water quality in Aquilla Lake drew multiple partners, ranging from a host of government entities to local farmers who work the land every day.

This fall, those partners agreed that their goal had been met-- atrazine concentrations in the reservoir were down by about 60 percent, compared to the earlier readings. Today, annual average atrazine levels in Aquilla Lake are lower than those required for treated drinking water.

How was this problem resolved? The answer lies with a network of cooperative partners who worked to understand the problem and then do something about it.

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Popular Herbicide

The fact that atrazine would be commonly used in the watershed surrounding Aquilla Lake came as no surprise. The area is populated with corn and sorghum producers who want an economical way to control weeds. About 63,000 acres, or 40 percent of the watershed, is in crop production.

Atrazine is known as an inexpensive, effective weed suppressant. But problems can arise when recently treated fields get a healthy rain shower. The herbicide is carried by runoff into ditches and streams, which eventually empty into the lake.

Atrazine is not a known carcinogen, but at high enough concentrations it interferes with the hormonal system of test animals, according to the Environmental Protection Agency.

Located 10 miles from Hillsboro, Aquilla Lake was built in 1983 for water supply, flood control, and recreation. It is the sole drinking water source for more than 18,000 residents of Hill County and a popular destination for swimmers, boaters, and fishermen.

The atrazine levels found in 1997 and 1998 led the TCEQ to list the lake as "impaired" and in need of cleanup. The agency initiated a total maximum daily load (TMDL) project to determine the amount (or load) of pollutant the lake could receive and still support its designated uses.

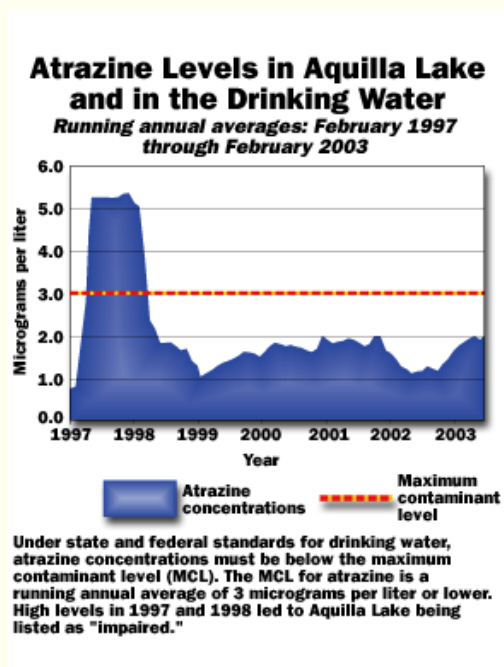
Also, the TCEQ's Source Water Assessment and Protection team conducted



definition

Best management practices are the methods determined to be the most effective, practical means of preventing or reducing pollution.

assessments and inventories to determine the origin of atrazine within the watershed. The team discovered more than 600 potential contamination sources, such as fertilizer and pesticide application sites. All this information was forwarded to the Aquilla Water Supply District to help residents protect water quality.



The TSSWCB led a coordinated effort to change agricultural practices that contribute to atrazine pollution in the lake. The agency worked with area producers and other stakeholders to implement "best management practices" for atrazine reduction.

The TSSWCB also worked with other agricultural agencies to provide training on safe pesticide application. These meetings reached hundreds of agricultural producers and led to an increased awareness of water quality in general.

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Action at the Local Level

The primary responsibility for reducing atrazine fell to agricultural producers in the watershed.

A key factor was the coordination of activities and interested parties through the Texas Watershed Protection Committee, an independent body formed to address threats to several lakes from atrazine contamination.

Committee members developed educational materials on preferred herbicide and pesticide practices and invited

speakers to forums on water quality topics. They also met with pesticide dealers to raise their awareness of the problem.

Area farmers took the initiative to re-examine their own growing practices--deciding, for example, to till herbicides into the soil rather than applying on the surface. After a year, about one-third of area farmers had adopted this strategy, which reduces runoff into waterways; two years later, participation neared 100 percent.

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Model Established

The activities developed and implemented for the Aquilla watershed have also been used to lower atrazine pollution in several other watersheds, where atrazine levels were lower than Aquilla's but high enough to threaten sources of drinking water.

Monitoring by the TCEQ in the North Central Texas region shows that atrazine concentrations have dropped in Big Creek Lake, Joe Pool Lake, Lavon Lake, Lake Tawakoni, Marlin Lake, and Richland-Chambers Reservoir.

The Bardwell and Waxahachie reservoirs are still being monitored, but results so far indicate that in the next six months they will no longer be classified as "threatened." Little River will be monitored for another 12 months.

The success of this comprehensive, collaborative approach to reducing atrazine impairments and threats to sources of drinking water holds promise for future watershed projects.

Agricultural producers living in the Aquilla watershed responded effectively--with the assistance of state and federal agencies--to a water quality problem that had the potential to affect people's health and the environment.

The TCEQ's TMDL project served an essential coordinating function, helping to focus limited resources to meet water quality restoration needs.

A variety of best management practices for the prevention and reduction of atrazine pollution in surface water were developed and tested. These measures have been used effectively in 10 watersheds and can be used throughout the state to prevent further threats to surface water from atrazine pollution.

Contributing to this article: Louanne Jones

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Key Players

The TCEQ and the Texas State Soil and Water Conservation Board took the lead in implementing the atrazine reduction project and developing the TMDL. The activities of the Texas Watershed Protection Committee were vital to the project. Headed by the Texas Department of Agriculture, membership includes representatives of the Blacklands Research Center, the Texas Cooperative Extension, the USDA-Natural Resources Conservation Service, the Brazos

River Authority, the Texas Farm Bureau, as well as the TCEQ and TSSWCB.

Regional participants included the Aquilla Water Supply District, the Woodrow-Osceola Water Supply Corp., the Hill County Appraisal District, and the Hill County Blackland Soil and Water Conservation District. The U.S. Army Corps of Engineers also participated.

Farming Methods Get an Update

Corn and sorghum farmers in the Aquilla watershed were willing to alter traditional growing practices to help restore water quality.

Some of the most commonly used innovations for pollution prevention were:

Land cultivation. Rather than spreading atrazine just on the surface to control weeds, farmers began tilling the herbicide into the soil during the annual application.

Barriers. Instead of plowing fields adjacent to waterways, growers planted perennial vegetation on that strip of land to slow runoff and filter out pollutants.

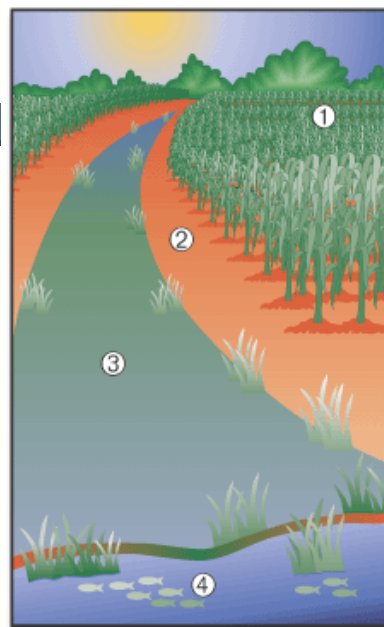
Grade stabilization. A wide range of structures was designed to stabilize the grade of water channels. This also slows erosion and deters gullies from forming. Also, retention ponds are sometimes built below these structures to detain runoff and allow for further removal of atrazine.

Grassed waterways. Channels (natural and constructed) that carry water were planted with perennial vegetation to slow runoff and help filter out pollutants.

Terraces. Earthen embankments, channels, or combinations of ridges and channels were built across slopes to prevent runoff.

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Pollution Prevention



Here are some of the best management practices that helped minimize the amount of atrazine reaching the lake. A field of corn (1) is cultivated by working the herbicide into the soil, rather than just applying it on top of the ground, to reduce runoff and surface water contamination. Farmers also can plant filter strips of vegetation (2) next to the fields to help remove some of the sediment, organic materials, and pollutants that move downhill with rainfall runoff. A grassed waterway (3) is a means of directing the runoff downstream while removing pollutants at the same time. Without some or all of these strategies, much more atrazine would end up in the lake (4), which is a source for drinking water.

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Last Modified Thu, 21 Jul 2011
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